

## CLAIMS

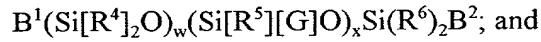
What is claimed is:

1 1. A composition comprising:

2 1) a compound of the formula:



4 2) a compound of the formula:

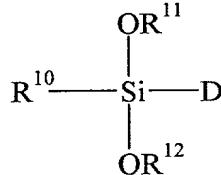


6 3) a crosslinker selected from the group consisting of:

7 a) compounds of the formula:



9 b) compounds of the formula:



12

13 wherein

14  $R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8,$  and  $R^9$  are independently selected from the group

15 consisting of alkyl groups of from 1 to 4 carbon atoms;

16 E is a monovalent organic group comprising at least one epoxy group;

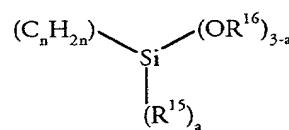
17  $A^1$  and  $A^2$  are independently selected from the group consisting of alkyl groups of from

18 1 to 4 carbon atoms and monovalent organic groups comprising at least one epoxy group;

19 u is an integer from 1 to about 2000;

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21 v is an integer from 0 to about 200;  
22 the sum of u and v is from 1 to about 2200;  
23 G is selected from the group consisting of hydroxy and alkoxy;  
24 B<sup>1</sup> and B<sup>2</sup> are independently selected from the group consisting of alkyl groups of from  
25 1 to 4 carbon atoms, hydroxy, and alkoxy;  
26 w is an integer from 1 to about 1000;  
27 x is an integer from 0 to about 50;  
28 the sum of w and x is from 1 to about 1050;  
29 Z<sup>1</sup> and Z<sup>2</sup> are independently selected from the group consisting of hydrogen and alkyl  
30 groups of from 1 to 4 carbon atoms;  
31 y is from 1 to about 1000;  
32 z is from 0 to about 2000;  
33 the sum of y and z is from 1 to about 3000;  
34 D is selected from the group consisting of hydrogen, substituted or unsubstituted C<sub>1-</sub>  
35 C<sub>12</sub> hydrocarbon moieties, OR<sup>14</sup>, and moieties of the formula:



39           R<sup>10</sup> and R<sup>15</sup> are independently selected from the group consisting of hydrogen,  
40        substituted or unsubstituted C<sub>1</sub>-C<sub>12</sub> hydrocarbon moieties, and OR<sup>13</sup>;  
41           R<sup>11</sup>, R<sup>12</sup>, R<sup>13</sup>, R<sup>14</sup>, and R<sup>16</sup> are independently selected from the group consisting of C<sub>1</sub>-  
42        C<sub>6</sub> hydrocarbon moieties;

43           n is 1, 2, or 3; and

44           a is 0, 1, or 2.

1       2.     The composition of claim 1 in the form of an aqueous emulsion.

1       3.     The composition of claim 2 further comprising a catalyst.

1       4.     The composition of claim 2 further comprising at least one surface active agent.

1       5.     The composition of claim 3 wherein the catalyst is selected from the group consisting  
2       of metal salts of acids, zinc chloride, magnesium chloride, aluminum chloride, metal soaps,  
3       non-polymeric anhydrides, and butyl acid phosphate.

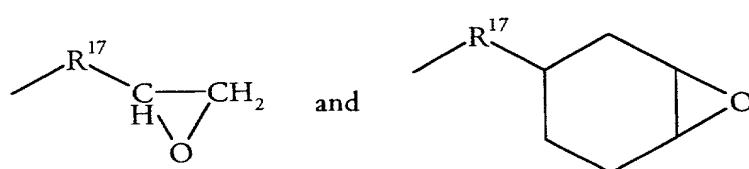
1       6.     The composition of claim 4 wherein the surface active agent is selected from the group  
2       consisting of non-ionic surface active agents, anionic surface active agents, and cationic  
3       surface active agents.

1       7.     The composition of claim 1 wherein R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup>, and R<sup>9</sup> are all the  
2       same.

1       8.     The composition of claim 7 wherein R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup>, and R<sup>9</sup> are all  
2       methyl.

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1 9. The composition of claim 1 wherein E is selected from the group consisting of moieties  
2 of the structural formulae:



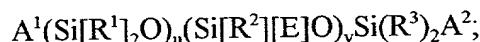
wherein R¹⁷ is a divalent substituted or unsubstituted organic group.

1 10. The composition of claim 1 wherein 3)b) is selected from the group consisting of  
2 methyltrimethoxysilane, methyltriethoxysilane, ethyltriethoxysilane,  
3 methylpentamethoxydisilylethane, tetraethoxysilane, cyclohexyltriethoxysilane and  
4 methyltripropoxysilane.

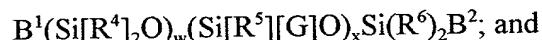
1 11. A process of treating textiles comprising the steps of:

2 A) providing an aqueous emulsion comprising a composition comprising:

3 1) a compound of the formula:



5 2) a compound of the formula:

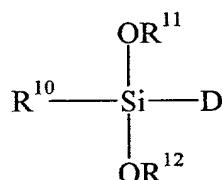


7 3) a crosslinker selected from the group consisting of:

8 a) compounds of the formula:



10                   b)       compounds of the formula:



13                   wherein

14

15                   R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup>, and R<sup>9</sup> are independently selected from the group  
16                   consisting of alkyl groups of from 1 to 4 carbon atoms;

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18                   E is a monovalent organic group comprising at least one epoxy group;  
19                   A<sup>1</sup> and A<sup>2</sup> are independently selected from the group consisting of alkyl groups  
20                   of from 1 to 4 carbon atoms and monovalent organic groups comprising at least one epoxy  
21                   group;

22                   u is an integer from 1 to about 2000;

23                   v is an integer from 0 to about 200;

24                   the sum of u and v is from 1 to about 2200;

25                   G is selected from the group consisting of hydroxy and alkoxy;

26                   B<sup>1</sup> and B<sup>2</sup> are independently selected from the group consisting of alkyl groups  
27                   of from 1 to 4 carbon atoms, hydroxy, and alkoxy;

28                   w is an integer from 1 to about 1000;

29                   x is an integer from 0 to about 50;

30                   the sum of w and x is from 1 to about 1050;

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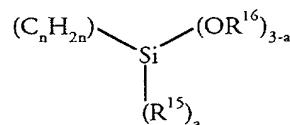
31           Z<sup>1</sup> and Z<sup>2</sup> are independently selected from the group consisting of hydrogen  
32        and alkyl groups of from 1 to 4 carbon atoms;

33           y is from 1 to about 1000;

34           z is from 0 to about 2000;

35           the sum of y and z is from 1 to about 3000;

36           D is selected from the group consisting of hydrogen, substituted or  
37        unsubstituted C<sub>1</sub>-C<sub>12</sub> hydrocarbon moieties, OR<sup>14</sup>, and moieties of the formula:



R<sup>10</sup> and R<sup>15</sup> are independently selected from the group consisting of hydrogen,  
substituted or unsubstituted C<sub>1</sub>-C<sub>12</sub> hydrocarbon moieties, and OR<sup>13</sup>;

R<sup>11</sup>, R<sup>12</sup>, R<sup>13</sup>, R<sup>14</sup>, and R<sup>16</sup> are independently selected from the group consisting  
of C<sub>1</sub>-C<sub>6</sub> hydrocarbon moieties;

n is 1, 2, or 3; and

a is 0, 1, or 2.

B) providing a catalyst suitable to the aqueous emulsion that will promote a  
condensation reaction between compounds 1), 2), and 3);

C) mixing the aqueous emulsion and the catalyst to form a mixture;

D) applying the mixture to the textile; and

E) heat treating the textile to form a condensation reaction product of compounds  
of 1), 2), and 3);

53 whereby the textile has enhanced durability, water repellency, and softness.

1       12.     The process of claims 11 further comprising the step of removing an excess of the  
2 aqueous emulsion from the textile.

1       13.     The process of claim 11 wherein the aqueous emulsion further comprises at least one  
2 surface active agent.

1       14.     The process of claim 11 wherein the catalyst is selected from the group consisting of  
2 metal salts of acids, zinc chloride, magnesium chloride, aluminum chloride, metal soaps, non-  
3 polymeric anhydrides, and butyl acid phosphate.

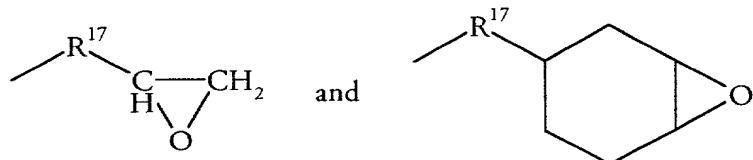
1       15.     The process of claim 13 wherein the surface active agent is selected from the group  
2 consisting of non-ionic surface active agents, anionic surface active agents, and cationic  
3 surface active agents.

1       16.     The process of claim 11 wherein R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup>, and R<sup>9</sup> are all the same.

1       17.     The process of claim 16 wherein R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup>, and R<sup>9</sup> are all methyl.

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1       18. The process of claim 11 wherein E is selected from the group consisting of  
2       the structural formulae:



wherein R<sup>17</sup> is a divalent substituted or unsubstituted organic group.

1       19. The process of claim 11 wherein 3)b) is selected from the group consisting of  
2       methyltrimethoxysilane, methyltriethoxysilane, ethyltriethoxysilane,  
3       methylpentamethoxydisilylethane, tetraethoxysilane, cyclohexyltriethoxysilane and  
4       methyltripropoxysilane.